

CLAIMS:

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1. A method for identifying a phase of an incoming UWB signal at a UWB receiver, comprising the steps of:
receiving incoming pulses of the incoming UWB signal, adjacent pulses of said incoming pulses arriving at a predetermined interval;
generating local pulses at the UWB receiver;
correlating the local pulses with the incoming pulses to produce a correlation function;
and
selecting a detecting arm to identify the phase based on the correlation function.
 2. A method of claim 1, wherein the predetermined interval is the time between the incoming pulses.
 3. A method of claim 1, wherein the incoming pulses are at least one of bi-phase modulated, and quadrature phase modulated.
 4. A method of claim 3, wherein the incoming pulses are multilevel pulses.
 5. A method of claim 1, wherein the step of correlating the incoming pulses with the local pulses to produce a correlation function comprises:
shifting a phase of the local pulses; and
calculating a correlation value of the local pulses and the incoming pulses.
 6. A method of claim 5, wherein the correlation value comprises the correlation function.
 7. A method of claim 1, wherein the step of selecting a detecting arm to identify the phase based on the correlation function comprises:
finding a first correlation value for a first detecting arm that exceeds a predetermined threshold;
finding a second correlation value for a second detecting arm that exceeds the

predetermined threshold; and

comparing the first correlation value to the second correlation value to select the detecting arm with a higher correlation value.

8. A method of claim 7, wherein the predetermined threshold is based on a desired bit error rate of the incoming UWB signal.

9. A system for identifying a phase of an incoming UWB signal at a UWB receiver, comprising:

an antenna configured to receive incoming pulses of the UWB signal, adjacent pulses of said incoming pulses occurring at a predetermined interval;

a signal generator configured to generate local pulses;

a correlator configured to correlate the incoming pulses with the local pulses to produce an correlation function; and

a selector configured to select a detecting arm to identify the phase based on the correlation function.

10. A system of claim 9, wherein the predetermined interval is a distance between the incoming pulses in time.

11. A system of claim 9, wherein the incoming pulses are at least one of bi-phase modulated, and quadrature phase modulated.

12. A system of claim 11, wherein the incoming pulses are multilevel pulses.

13. A system of claim 9, wherein the correlator comprises:

a phase adjuster configured to adjust a phase of the local pulses; and

a calculator configured to calculate an correlation value of the local pulse and the incoming pulse.

14. A system of claim 13, wherein a plurality of the correlation value comprises the correlation function.

15. A system of claim 9, wherein the selector comprises:

a calculator configured to find a first correlation value for a first detecting arm that exceeds a predetermined threshold and a second correlation value for a second detecting arm that exceeds the predetermined threshold; and

a comparator configured to compare the first correlation value to the second correlation value to select the detecting arm with a higher correlation value.

16. A system of claim 15, wherein the predetermined threshold is based on a desired bit error rate of the incoming UWB signal.

17. A system for identifying a phase of an incoming UWB signal at a UWB receiver, comprising:

means for receiving incoming pulses of the incoming UWB signal, adjacent pulses of said incoming pulses arriving at a predetermined interval;

means for generating local pulses at the UWB receiver;

means for correlating the local pulses with the incoming pulses to produce a correlation function; and

means for selecting a detecting arm to identify the phase based on the correlation function.

18. A method of claim 1, wherein the step of selecting a detecting arm to identify the phase based on the correlation function comprises:

finding a first correlation value for a first detecting arm that exceeds a predetermined threshold;

decreasing the predetermined threshold until the first correlation value is found;

finding a second correlation value for a second detecting arm that exceeds the predetermined threshold; and

comparing the first correlation value to the second correlation value to select the detecting arm with a higher correlation value.

19. A method of claim 18, wherein the predetermined threshold is based on a desired

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bit error rate of the incoming UWB signal.

20. A method of claim 1, wherein the step of selecting a detecting arm to identify the phase based on the correlation function comprises:

finding a first correlation value for a first detecting arm that exceeds a predetermined threshold;

determining a first phase corresponding to the first correlation value;

finding a second correlation value for a second detecting arm that exceeds the predetermined threshold over a phase range beginning with the first phase; and

comparing the first correlation value to the second correlation value to select the detecting arm with a higher correlation value.

21. A method of claim 20, wherein the predetermined threshold is based on a desired bit error rate of the incoming UWB signal.

22. A system of claim 9, wherein the selector comprises:

a calculator configured to find a first correlation value for a first detecting arm that exceeds a predetermined threshold and a second correlation value for a second detecting arm that exceeds the predetermined threshold;

a subtractor configured to decrease the predetermined threshold until the first correlation value is found; and

a comparator configured to compare the first correlation value to the second correlation value to select the detecting arm with a higher correlation value.

23. A system of claim 22, wherein the predetermined threshold is based on a desired bit error rate of the incoming UWB signal.

24. A system of claim 9, wherein the selector comprises:

a calculator configured to find a first correlation value for a first detecting arm that exceeds a predetermined threshold and a second correlation value for a second detecting arm that exceeds the predetermined threshold over a phase range beginning with a first phase;

a detector configured to determine the first phase corresponding to the first correlation

a comparator configured to compare the first correlation value to the second correlation value to select the detecting arm with a higher correlation value.

25. A system of claim 24, wherein the predetermined threshold is based on a desired bit error rate of the incoming UWB signal.

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